REMARKS

Reconsideration of the above-identified patent application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-24 are in this case. Claims 2-5, 12-14 and 21-24 have been rejected under § 103(a). Claims 6-11 and 15-20 have been objected to. New claims 25 and 26 have been added.

The claims before the Examiner are directed toward methods by which a base station, to which a mobile unit could be handed off from another base station presently in communication with the mobile unit, detects the presence of the mobile unit, with no or minimal participation by the mobile unit. According to one method, the base stations use frequency hopping to communicate with the mobile unit. The base station that is initially communicating with the mobile unit periodically yields a hop to allow neighboring base stations to communicate with the mobile unit so as to detect the mobile unit. According to the other method, either the base station currently communicating with the mobile unit or one of the neighboring base stations issues a PING command to the mobile unit. The neighboring base stations receive an ECHO reply from the mobile unit.

Objections to the Drawings

The Examiner has objected to Figure 1 as lacking an indication that it illustrates prior art. Apparently the Examiner did not receive the replacement Figure 1 that was included with the communication filed on April 22, 2004. Attached please find a replacement Figure 1 with the legend "PRIOR ART' added. Also attached please find replacement Figures 6A, 6B, 7A, 7B and 7C, that also were included with

the communication filed on April 22, 2004 but that apparently were not received by the Examiner.

§ 103(a) Rejections – Farwell et al. '354 in view of Takahashi et al. '518

The Examiner has rejected claims 1, 22 and 23 under § 103(a) as being unpatentable over Farwell et al., EP Patent Application No. 0 594 354 A2 (henceforth, "Farwell et al. '354") in view of Takahashi et al., US Patent No. 6,275,518 (henceforth, "Takahashi et al. '518"). The Examiner's rejection is respectfully traversed.

Farwell et al. '354 teach a method of handing off a mobile unit 105 from a base station 104 to a base station 103 or 102 in a system in which the base stations communicate with mobile unit 105 using frequency hopping. When the strength of the signal that base station 104 receives from mobile unit 105 falls below a threshold, base station 104 sends a start handoff message to mobile unit 105 and notifies the other base units, via a system controller and switch 101, that a possible handoff has commenced. Mobile unit 105 starts repeatedly broadcasting a synchronization pattern. System controller and switch 101 determines which base station is receiving the strongest signal from mobile unit 105 and instructs that base station to take over communication with mobile unit 105. Whichever base station takes over communication with mobile unit 105 sends mobile unit 105 a stop handoff message. In response to the stop handoff message, mobile unit 105 stops broadcasting the synchronization pattern.

The crucial difference between the present invention as recited in independent claims 1 and 22 and the teachings of Farwell et al. '354 is that base station 104 of Farwell et al. '354 never yields a hop or a time-interval. The frequency hopping method used by Farwell et al. '354 is described in column 3 lines 36-46 as follows:

> During an active call, voice information is transmitted by repeatedly sequencing through the set (commonly referred to as frequency hopping) with two-way voice transmission occurring for 5 milliseconds in each channel. This type of transmission is disclosed in greater detail in the U.S. Patent Application M. E. Gillis, et al. "A Cordless Telephone Arranged for Operation in a Frequency Hopping System, Case No. 1-6-2-1, filed October 21, 1991, Serial No. 07/779754 and assigned to the same assignee as the present application.

US 07/779754 has issued as US Patent No.5,353,341. A copy of this patent again is attached for the convenience of the Examiner. The frequency hopping method used by Farwell et al. '354 is described in more detail in column 6 lines 43-58 of US 5,353,341 as follows:

> Communications between the base unit and the handset unit occur in time periods designated as transmission frames. In a frame, the base unit and the handset unit both transmit to each other. A typical transmission frame may be, for example, 5 milliseconds in length and contain time slots for approximately 500 bits of information. In operation, the base unit generally transmits in the first half of each frame or for 2.5 milliseconds and is then reconfigured to receive a signal from the handset unit which transmits in the second half of each frame or for 2.5 milliseconds on the same frequency. The handset unit operates in complementary fashion to the base unit in that it receives in the first half of each frame and is reconfigured to transmit in the second half of each frame. This cyclic frame transmission generates 80 frames in approximately 400 milliseconds.

So as best understood, as long as base station 104 and mobile unit 105 are communicating with each other, and until system controller and switch 101 instructs base station 104 to stop communicating with mobile unit 105, base station 104 transmits to mobile unit 105 in every time slot of every frame, and never skips a time slot. Note that the "time slots" of US 5,353,341 are equivalent to the "hops" of independent claim 1 and the "time intervals" of independent claim 22.

The Examiner now cites Takahashi et al. '518 to show that "hopping to a next frequency at each hopping time" and "means for calculating hopping time" (actually, "means for calculating an interval between" hopping times of two different base

stations) is known in the art. The Examiner's citation is correct but irrelevant. Takahashi et al. '518 teach a method of coordinating frequency hopping in a wireless LAN so that different base stations do not interfere with each other. One of the base stations is designated as a "master" base station. The other base stations then are "slave" base stations. Base stations with overlapping cells avoid interfering with each other by cycling through a set of transmission frequencies at different relative phases. As shown for example in Figure 10A, if the clock of a slave base station drifts relative to the clock of the master base station to the point that the two base stations start transmitting on the same frequency, the slave base station skips a frequency. Note that the slave base station skips a frequency, not a hop. All the base stations transmit in every hop. Therefore, Takahashi et al. '518 is irrelevant to the present invention as recited in independent claims 1 and 22.

With independent claim 1 allowable in its present form, it follows that claim 23, that depends therefrom, also is allowable.

§ 103(a) Rejections – Farwell et al. '354 in view of Fudge '552

The Examiner has rejected claims 3-5, 13, 14 and 24 under § 103(a) as being unpatentable over Farwell et al. '354 in view of Fudge, US Patent No. 6,205,552 (henceforth, "Fudge '552"). The Examiner's rejection is respectfully traversed.

Fudge '552 teaches a method of efficient IP scanning of devices on an IP network **100**. Exposure analysis processor **120** PINGs all the addresses in address database **130**. Only addresses that actually have devices connected to them return ECHOs. Only these addresses need to be IP-scanned In other words, exposure analysis processor **120** determines the presence of a device by PINGing the device's address and receiving an ECHO in response. Purportedly, it follows that base station 104 of Farwell et al. '354 could initiate a handoff by sending a PING message instead

of a start handoff message to mobile unit 105, and mobile unit 105 could respond by broadcasting an ECHO as a synchronization pattern. However, this combination of the teachings of the two references would be inoperative, for the same two reasons that were cited in the communication of April 22, 2004 against the combination of Farwell et al. '354 and Grounds et al., US Patent No. 6,510,381.

The first reason is that, as is well-known in the art, in packet-based communications systems generally, and in particular in IP network **100** of Fudge '552, it is not possible to predict in advance when a transmitted packet will arrive at its destination. This makes it impossible to use the exchange of a PING and an ECHO for synchronization.

The second reason is that, as is well-known in the art, the purpose of the PING-ECHO combination is for the device that sends the PING message to verify that the device that responds with an ECHO message is still communicating. For this purpose, a PING message invokes a single ECHO message. Now, as stated in Farwell et al. '354 column 4 lines 26-29,

> Base stations 102 and 103...utilize the synchronization pattern in hopping channel 0 to come into synchronization with mobile unit 105.

To this end, mobile unit 105 needs to keep broadcasting the synchronization pattern until base stations 102 and 103 are synchronized with mobile unit 105. (Note that this is not necessary in the present invention because the base stations of the present invention synchronize to each other, as described in the specification on page 37 line 5 through page 38 line 21.) This is why the base station to which mobile unit 105 is handed off needs to send a stop handoff message to mobile unit 105: otherwise, mobile unit 105 would just keep on broadcasting the synchronization pattern.

Although these two arguments suffice to show the allowability of independent claim 13 over the combination of Farwell et al. '354 and Fudge '552, there is an

additional reason why independent claim 13 is allowable over the combination of Farwelll et al. '354 and Fudge '552. In Fudge '552, the same device (exposure analysis processor **120**) both issues the PING and receives the ECHO. According to independent claim 13, the Base Station connected with the mobile unit sends the PING, but the Base Station waiting for the mobile unit receives the ECHO. There is neither a hint nor a suggestion in Fudge '552 of any utility to having different devices issue the PING and receive the ECHO.

With independent claims 3 and 13 allowable in their present form, it follows that claims 4, 5, 14 and 21, that depend therefrom, also are allowable.

New Claims

To further distinguish the present invention from the prior art cited by the Examiner, new claims 25 and 26 have been added. New claim 25 adds to claim 3 the limitation that each of the Base Station(s) that wait(s) for the mobile unit to enter its/their coverage area send(s) a plurality of PING commands to the mobile unit. New claim 26 adds to claim 13 the limitation that the Base Station connected to the mobile unit sends a plurality of PING commands to the mobile unit.

New claim 25 is supported in the specification on page 49 lines 24-27:

> As shown in **Figure 15A**, the handset 121 is currently communicating with the Base Station #1 123 via communications link 122. During this time, the Base Station #2 124 that is waiting for the call will periodically send a "PING" command 145 to the handset 121. (emphasis added)

New claim 26 is supported in the specification on page 50 lines 11-13:

> **Figure 15B** illustrates an alternative, "active" method for detecting the handset 121. In this example, The Base Station #1 123 that is currently connected to the handset 121 transmits a "PING" command 147, once in **M** hops. (emphasis added)

and in Figures 16A and 16B, in which the flow branches from block 403 to block 404 and eventually to block 407 ("Send PING with NMAC") whenever Hop_count modulo K is zero.

There is neither a hint nor a suggestion in Fudge '552 that exposure analysis processor **120** should PING an address more than once. Indeed, pinging an address more than once would be contrary to the purpose of Fudge '552, which is to make IP scanning more efficient.

Applicant notes in passing that the limitations added by new claims 25 and 26 are implicit in old claims 9 and 18 ("...quality measurements for successful PINGs").

Objections

The Examiner has objected to claims 6-11 and 15-20 as being based on rejected base claims. The Examiner has noted that claims 6-11 and 15-20 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

In view of the discussion above in the context of the § 103(a) rejections, Applicant submits that the base claims from which claims 6-11 and 15-20 depend are allowable, making claims 6-11 and 15-20 allowable in their present form.

In view of the above amendments and remarks it is respectfully submitted that independent claims 1, 3, 13 and 22, and hence dependent claims 2, 4-12, 14-21 and 23-26 are in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,

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Registration No. 33,883

Date: September 27, 2004

REPLACEMENT SHEET

Figure 1 (PRIOR ART)

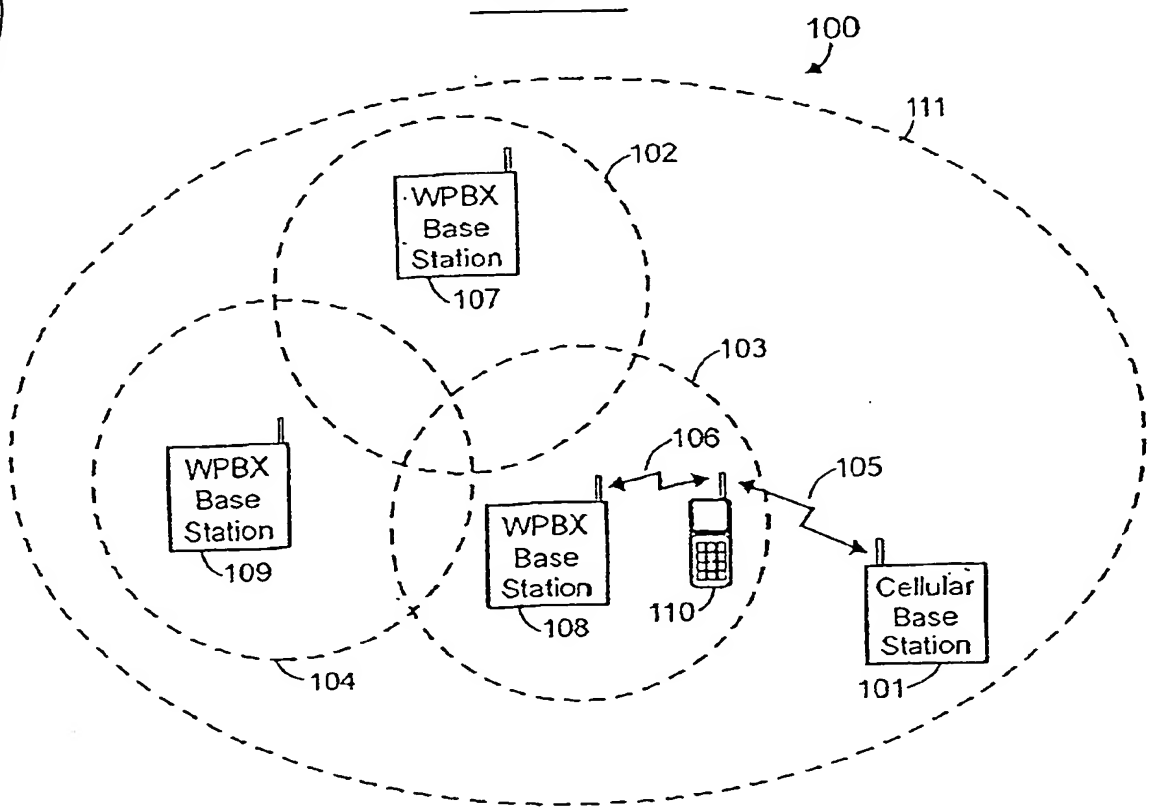
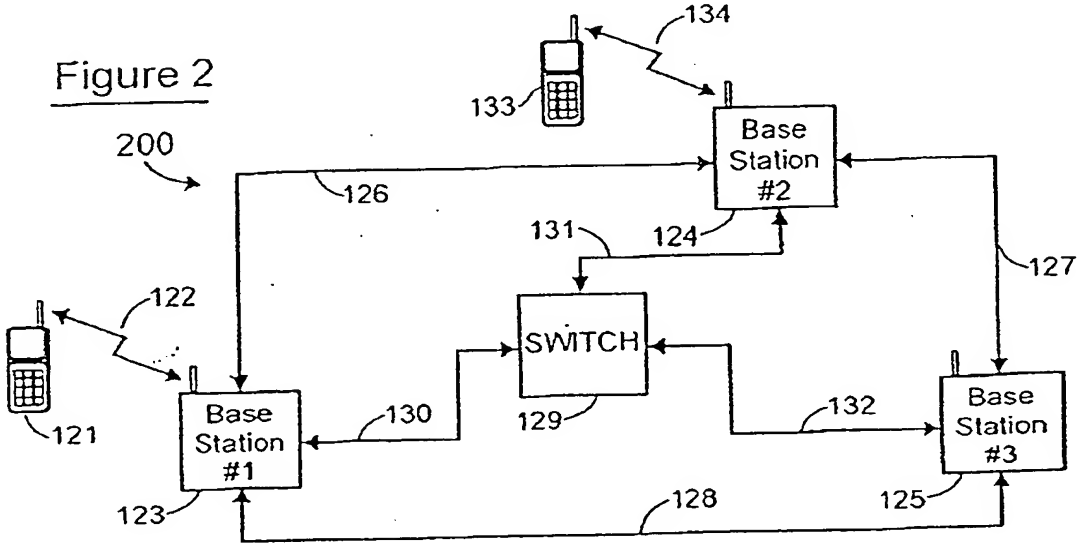


Figure 2



REPLACEMENT SHEET

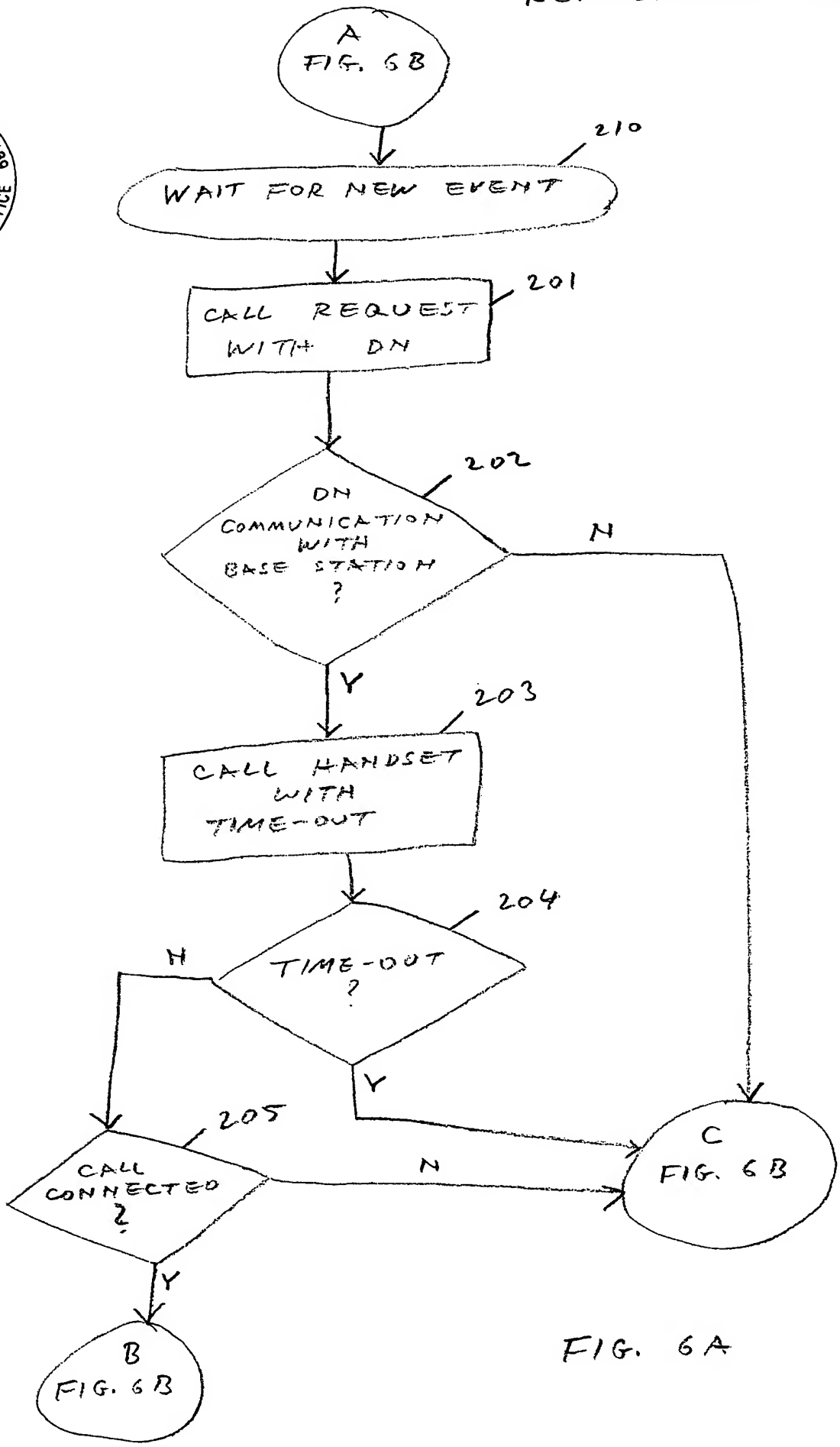


FIG. 6A

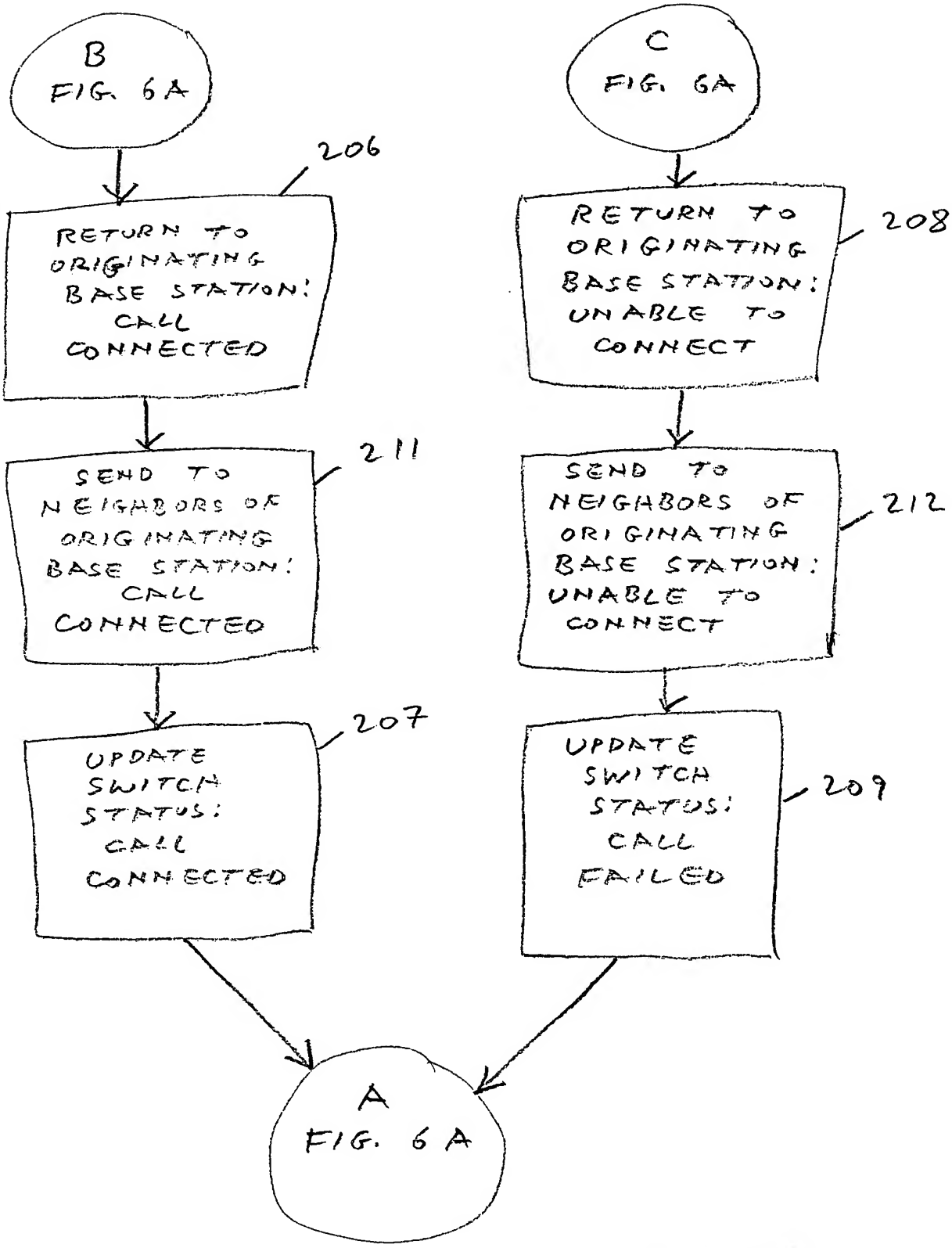


FIG. 6B

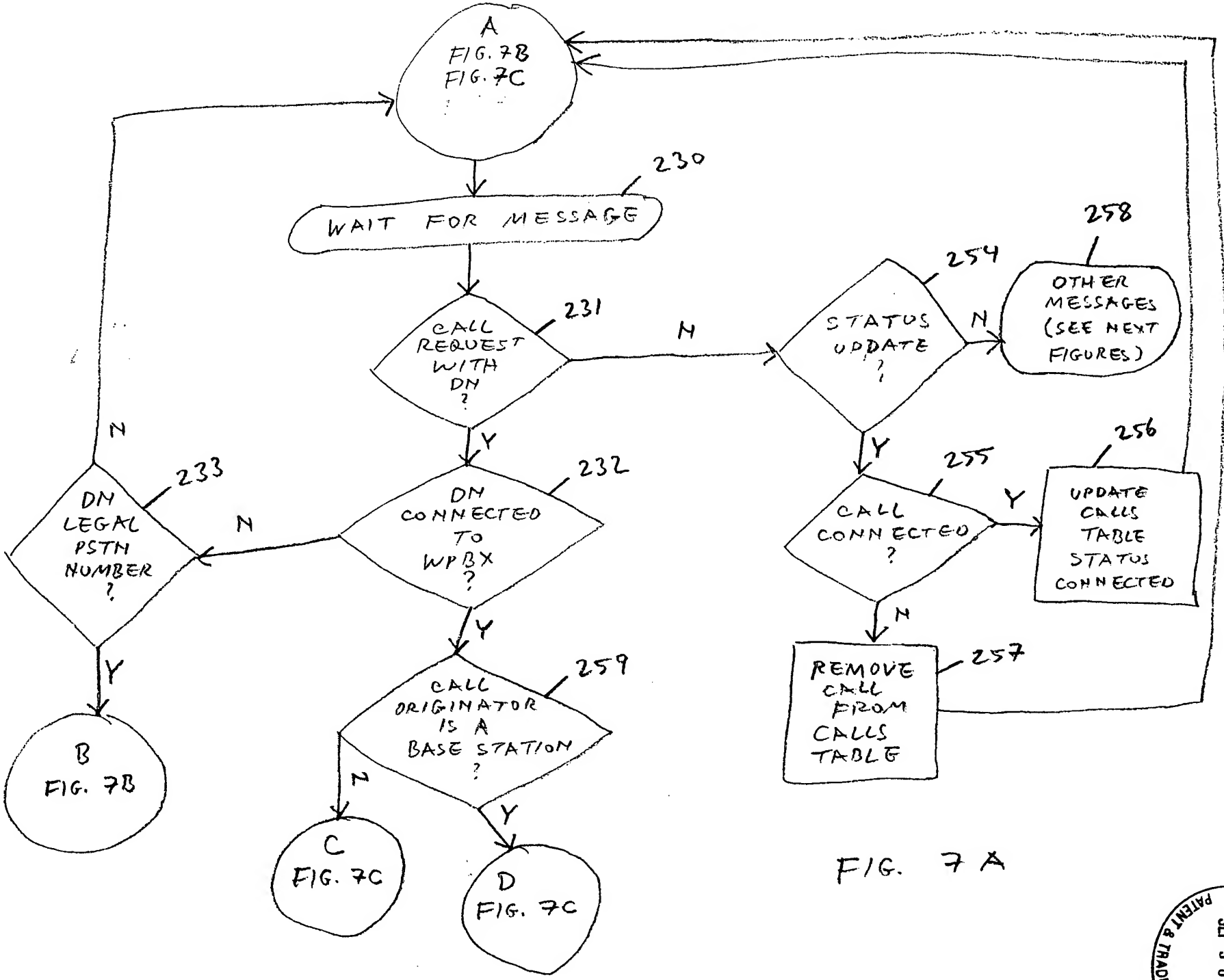
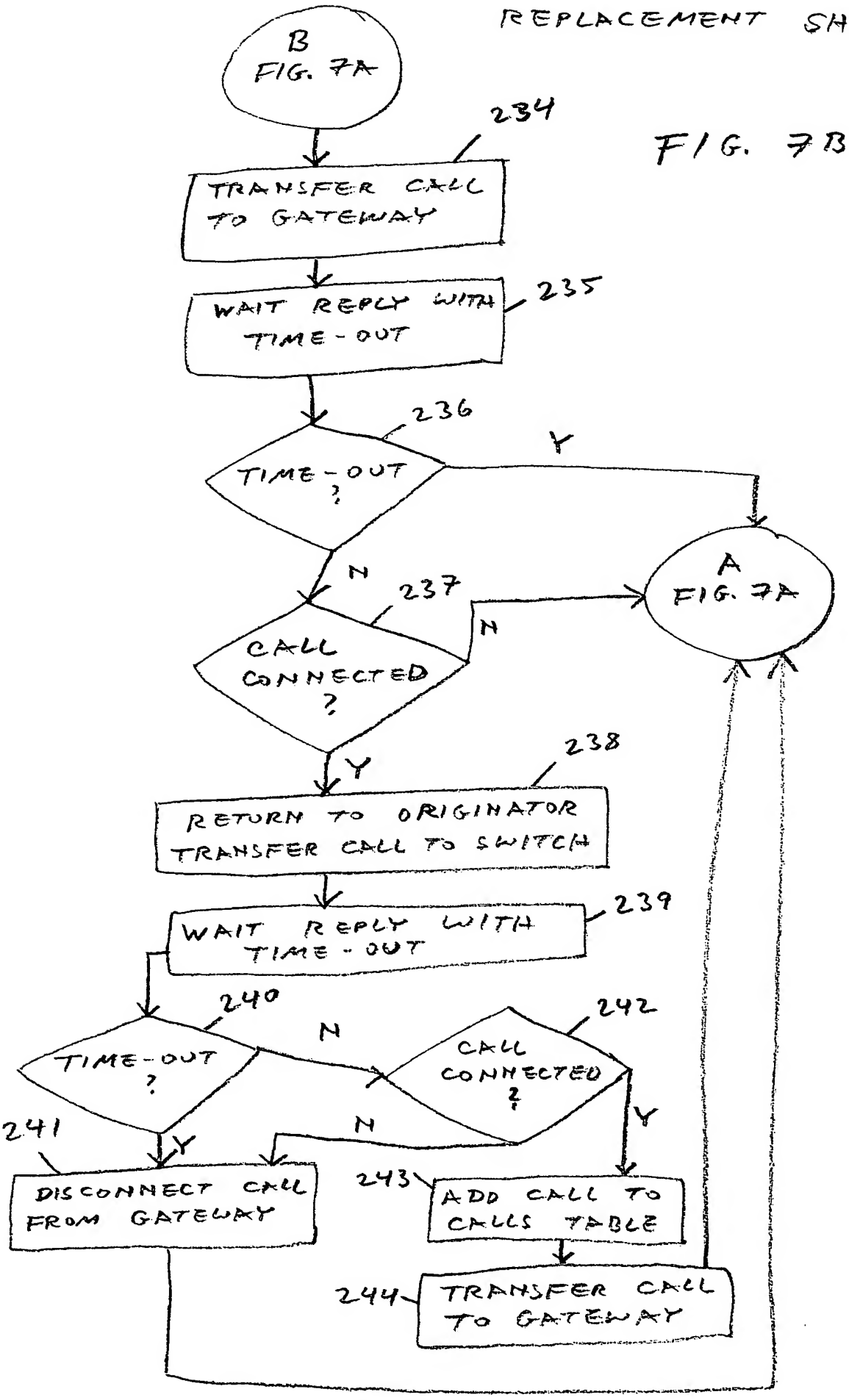


FIG. 7A

REPLACEMENT SHEET

REPLACEMENT SHEET

FIG. 7B



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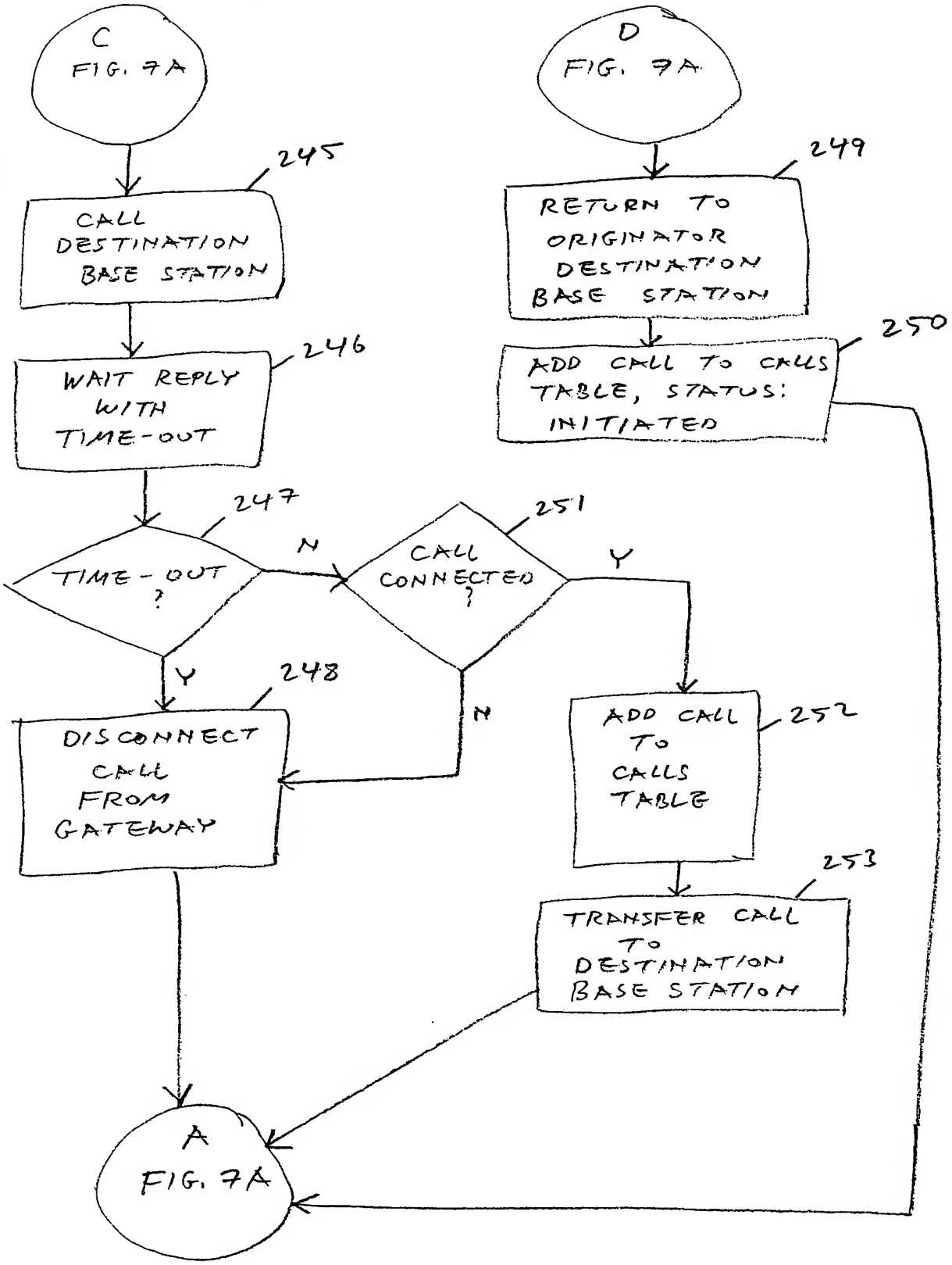

FIG. 7C